

SEQUENCE LISTING

<110> Tang, Y. Tom  
Zhou, Ping  
Goodrich, Ryle  
Liu, Chenghua  
Asundi, Vinod  
Zhao, Qing A.  
Yang, Yonghong  
Ren, Feiyan  
Wang, Jian-Rui  
Zhang, Jie  
Drmanac, Radoje T.

<120> Novel Nucleic Acids and  
Polypeptides

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<151> 2000-08-23

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15

48

cag ccg cca cg <sup>g</sup> ccc ctg cag cgc acg ccc aag tgc g <sup>cg</sup> cgc tgc Gln Pro Pro Arg Ala Pro Leu Gln Arg Thr Pro Lys Cys Ala Arg Cys	20	25	30	96	
cgc aac cat ggc gtc ctg tcc tgg ctc aag ggc cac aag cgt tac tgc Arg Asn His Gly Val Leu Ser Trp Leu Lys Gly His Lys Arg Tyr Cys	35	40	45	144	
cgc ttc aag gac tgc acc tgc gag aag tgc atc ctc atc atc gag cgg Arg Phe Lys Asp Cys Thr Cys Glu Lys Cys Ile Leu Ile Glu Arg	50	55	60	192	
cag cgg gtc atg gct g <sup>c</sup> cag gtg g <sup>c</sup> ctg cgc cgg cag cag gcc aac Gln Arg Val Met Ala Ala Gln Val Ala Leu Arg Arg Gln Gln Ala Asn	65	70	75	80	240
gag agc ttg gag agc ctc atc ccc gac tcg ctg cgc gct ctg cca ggg Glu Ser Leu Glu Ser Leu Ile Pro Asp Ser Leu Arg Ala Leu Pro Gly	85	90	95	288	
ccc ccg ccg ccg ggg gac gcc gtc gcc gcc ccg cag ccg cca gcc Pro Pro Pro Pro Gly Asp Ala Val Ala Ala Pro Gln Pro Pro Pro Ala	100	105	110	336	
tct cag ccg tcg cag ccg cag ccg cgc cct gct gcc gag ttg gcc Ser Gln Pro Ser Gln Pro Gln Pro Pro Arg Pro Ala Ala Glu Leu Ala	115	120	125	384	
g <sup>c</sup> g <sup>c</sup> g <sup>c</sup> g <sup>c</sup> ctg cgt tgg act gcc gag ccg cag ccc ggg gct ctg Ala Ala Ala Ala Leu Arg Trp Thr Ala Glu Pro Gln Pro Gly Ala Leu	130	135	140	432	
cag g <sup>c</sup> cag ctc g <sup>c</sup> aag cca gat ttg act gaa gaa cga ctt gga gac Gln Ala Gln Leu Ala Lys Pro Asp Leu Thr Glu Glu Arg Leu Gly Asp	145	150	155	160	480
g <sup>c</sup> aag tcg gca gac aat aca gag gtc ttc agt gac aaa gac act gac Gly Lys Ser Ala Asp Asn Thr Glu Val Phe Ser Asp Lys Asp Thr Asp	165	170	175	528	
cag agg agt tcc cca gat gtg gca aag agt aag ggc tgc ttc acc cct Gln Arg Ser Ser Pro Asp Val Ala Lys Ser Lys Gly Phe Thr Pro	180	185	190	576	
gag agc cct gag ata gtg tcc gtg gag gaa ggg gga tac gct gtc cag Glu Ser Pro Glu Ile Val Ser Val Glu Glu Gly Gly Tyr Ala Val Gln	195	200	205	624	
aaa aac gga ggc aac ccc gag agc cgc cct gac agc ccc aag tgt cac Lys Asn Gly Gly Asn Pro Glu Ser Arg Pro Asp Ser Pro Lys Cys His	210	215	220	672	
g <sup>c</sup> g <sup>c</sup> gag aat cac ctc ctg att gag ggc ccc tcg ggg act gtt tct Ala Glu Gln Asn His Leu Leu Ile Glu Gly Pro Ser Gly Thr Val Ser	225	230	235	240	720
ctg ccc ttc agc ttg aaa gcc aac aga ccg ccg ctt gaa gtg tta aaa				768	

Leu	Pro	Phe	Ser	Leu	Lys	Ala	Asn	Arg	Pro	Pro	Leu	Glu	Val	Leu	Lys	
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aag	ata	ttc	ccc	aac	cag	aag	cca	acg	gtg	ctt	gag	ctc	atc	ctc	aag	816
Lys	Ile	Phe	Pro	Asn	Gln	Lys	Pro	Thr	Val	Leu	Glu	Leu	Ile	Leu	Lys	
260								265					270			
ggc	tgt	ggc	ggg	gac	ctg	gtg	agc	gcc	gtg	gaa	gtc	ctt	ctg	tcc	agc	864
Gly	Cys	Gly	Gly	Asp	Leu	Val	Ser	Ala	Val	Glu	Val	Leu	Leu	Ser	Ser	
275								280					285			
cga	tcc	tca	gtc	acg	gga	gca	gag	cga	act	tcc	gca	gaa	cct	gag	agt	912
Arg	Ser	Ser	Val	Thr	Gly	Ala	Glu	Arg	Thr	Ser	Ala	Glu	Pro	Glu	Ser	
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cta	gct	ttg	ccc	tcc	aat	ggg	cac	atc	ttt	gaa	cac	acc	ttg	agc	tcc	960
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Tyr	Pro	Ile	Ser	Ser	Asn	Gly	Leu	Trp	Asp	Gln	Pro	Phe	Glu	Ser		
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Gln	Thr	Arg	*													
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gattgcttaa gcccagggtt caaggccagc ctggtaaca tgaacaattc ttaacgtcca	180
aagataacgt ctttccttaa cgtcgaaaga tgccttgtt tgatattaca gcagtcattc	240
ctgctcacta cgggcaggca gacagtgcag aaaaggtgaa gcacaaaaac taaaaaggaa	300
aatctctcct tgaaccactg cgaacagatc cgagtgttgg ggtactgtt ccagctggtt	360
ggtgaggttc tggttgaaca gtgtcccgcc aggtccgaag tggggacacg tctgttggtg	420
gtgtccaccc aactcagcca ctgcaggacc atcttgcgac tctttatgaa cctggcc	477
atg ttt gtc tac act aag caa tat ggc ctg ggg gca cag gag gag gac	525
Met Phe Val Tyr Thr Lys Gln Tyr Gly Leu Gly Ala Gln Glu Glu Asp	
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gcc ttt gtc cgc tgt gtc tcc gtc cta ggg aac ctg gct gac cag ctc	573
Ala Phe Val Arg Cys Val Ser Val Leu Gly Asn Leu Ala Asp Gln Leu	
20 25 30	
tac tac ccc tgt gag cac gtg gcc tgg gcg gct gat gcc cgg gtc ctc	621
Tyr Tyr Pro Cys Glu His Val Ala Trp Ala Ala Asp Ala Arg Val Leu	
35 40 45	
cac gtg gac tct tct cgg tgg acg ctg agt aca acc ctg tgg gcc	669
His Val Asp Ser Ser Arg Trp Trp Thr Leu Ser Thr Thr Leu Trp Ala	
50 55 60	
ctc tct ctg ctc ctg ggg gtt gcc agg tcc ctg tgg atg ctg ctg aaa	717
Leu Ser Leu Leu Gly Val Ala Arg Ser Leu Trp Met Leu Leu Lys	
65 70 75 80	
ctg aga cag agg ctg cgg agc ccc acg gcg ccc ttc acc agc ccg ctg	765

Leu Arg Gln Arg Leu Arg Ser Pro Thr Ala Pro Phe Thr Ser Pro Leu	85	90	95	
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Pro Arg Gly Lys Arg Arg Ala Met Glu Ala Gln Met Gln Ser Glu Ala				
100	105	110		
ctg tca ctt ctc agc aac ctg gcc gac ctg gcc aac gcc gtg cac tgg				861
Leu Ser Leu Leu Ser Asn Leu Ala Asp Leu Ala Asn Ala Val His Trp				
115	120	125		
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Leu Pro Arg Gly Val Leu Trp Ala Gly Arg Phe Pro Pro Trp Leu Val				
130	135	140		
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Gly Leu Met Gly Thr Ser Cys Leu Pro Ala Cys Thr Arg Arg Pro				
145	150	155	160	
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Gly Pro Ala Ala Arg Pro Arg Pro Leu Pro Pro Asp Thr Ala Gly Arg				
165	170	175		
gca cag gga cac agc cag agc cca cgg agg gcc ctt ccc gca aag cag				1053
Ala Gln Gly His Ser Gln Ser Pro Arg Arg Ala Leu Pro Ala Lys Gln				
180	185	190		
aag ccg cca ggg cag ggg ccg ggg ctc tca tgg agc tgc ctg tgg tga				1101
Lys Pro Pro Gly Gln Gly Pro Gly Leu Ser Trp Ser Cys Leu Trp *				
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cagctggcgt cttgtatcca aatcaagatg aggaagaggg ggcctgtcgt gccttgagaa				1281
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tccggcagcc atctttatgt cttgggctg agactccagg ctgcccagca gaggataagg 180

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tgacggggag	gtg	atg ccc acg ctg gac atg gcc ttg ttc gac tgg acc	Met Pro Thr Leu Asp Met Ala Leu Phe Asp Trp Thr			349
		1 5	10			
gat tat gaa	gac tta aaa	cct gat ggt tgg ccc tct	gca aag aag aaa			397
Asp Tyr Glu	Asp Leu Lys	Pro Asp Gly Trp Pro Ser Ala Lys Lys Lys				
	15 20	25				
gag aaa cac	cac cgc ggt	aaa ctc tcc agt gat ggt aac gaa aca tca cca				445
Glu Lys His	Arg Gly Lys	Leu Ser Ser Asp Gly Asn Glu Thr Ser Pro				
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gcc gaa ggg	gaa cca tgc	gac cat cac caa tac tgc ctg aca ggg act				493
Ala Glu Gly	Glu Pro Cys	Asp His His Gln Tyr Cys Leu Thr Gly Thr				
	45 50	55 60				
tgc tgc gac	ctg cgg gag	cat ttc tgc aca ccc cac aac cga ggc ctg				541
Cys Cys Asp	Leu Arg Glu	His Phe Cys Thr Pro His Asn Arg Gly Leu				
	65 70	75				
aac aac aaa	tgc ttc gat	gac tgc atg tgt gtg gaa ggg ctg cgc tgc				589
Asn Asn Lys	Cys Phe Asp	Asp Cys Met Cys Val Glu Gly Leu Arg Cys				
	80 85	90				
tat gcc aaa	ttc cac cgg	aac cgc agg gtt aca cgg agg aaa ggg cgc				637
Tyr Ala Lys	Phe His Arg	Asn Arg Arg Val Thr Arg Arg Lys Gly Arg				
	95 100	105				
tgt gtg gag	ccc gag acg	gcc aac ggc gac cag gga tcc ttc atc aac				685
Cys Val Glu	Pro Glu Thr	Ala Asn Gly Asp Gln Gly Ser Phe Ile Asn				
	110 115	120				
gtc tag cggccccg	ggactgggaa	ctgagccca gaggtttgc	caagccggc			741
Val *						
	125					
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gcccaggagc	cggcccgca	cacctgcaca	cacgaagtcc	ggacccacgc	agcctccatc	921
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Ala	Arg	Ala	Gly	Pro	Ala	Arg	Ala	Arg	Ala	Arg	Arg	Gly	Thr	Ser	Gly	Arg			
225		230										235					240		
ggg	ag	ct	tg	a	ag	tt	cc	cc	a	ac	ta	c	ag	gt	gc	tt	tt	gag	768
Gly	Ser	Leu	Lys	Phe	Pro	Met	Pro	Asn	Tyr	Gln	Val	Ala	Leu	Phe	Glu				
245		250										255							
aac	gaa	cc	gc	gg	cc	ac	ct	ct	c	ag	ct	ca	gc	ca	tc	ac	816		
Asn	Glu	Pro	Ala	Gly	Thr	Leu	Ile	Leu	Gln	Leu	His	Ala	His	Tyr	Thr				
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atc	gag	gg	gag	gag	gg	cc	gt	ag	ta	ta	g	ag	gg	ct	tt	864			
Ile	Glu	Gly	Glu	Glu	Arg	Val	Ser	Tyr	Tyr	Met	Glu	Gly	Leu	Phe					
275		280									285								
gac	gag	cg	cc	gg	ta	tt	cg	at	tc	ga	t	ct	gc	ac	gg	gc	912		
Asp	Glu	Arg	Ser	Arg	Gly	Tyr	Phe	Arg	Ile	Asp	Ser	Ala	Thr	Gly	Ala				
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gt	ag	ac	g	ac	g	ta	ct	g	ac	cc	a	ag	ag	ac	ca	gt	960		
Val	Ser	Thr	Asp	Ser	Val	Leu	Asp	Arg	Glu	Thr	Lys	Glu	Thr	His	Val				
305		310									315					320			
ctc	agg	gt	aaa	gg	gt	g	ac	ta	ct	ag	cc	cc	cc	tc	gg	cc	1008		
Leu	Arg	Val	Lys	Ala	Val	Asp	Tyr	Ser	Thr	Pro	Pro	Arg	Ser	Ala	Thr				
325		330									335								
acc	ta	tc	ac	gt	tt	gg	aa	g	ac	aa	g	ac	ca	ag	cc	gt	1056		
Thr	Tyr	Ile	Thr	Val	Leu	Val	Lys	Asp	Thr	Asn	Asp	His	Ser	Pro	Val				
340		345									350								
ttc	gag	ca	tc	ga	tg	ca	gg	ca	gg	aa	ct	ga	ga	gt	tg	1104			
Phe	Glu	Gln	Ser	Glu	Tyr	Arg	Glu	Arg	Val	Arg	Glu	Asn	Leu	Glu	Val				
355		360									365								
ggc	ta	ga	gt	cc	ac	at	cg	gc	ag	cg	ca	tc	gg	cc	at	1152			
Gly	Tyr	Glu	Val	Leu	Thr	Ile	Arg	Ala	Ser	Asp	Arg	Asp	Ser	Pro	Ile				
370		375									380								
aac	g	cc	aa	tt	cg	ta	cg	gt	tt	gg	gg	gc	tg	g	tc	1200			
Asn	Ala	Asn	Leu	Arg	Tyr	Arg	Val	Leu	Gly	Gly	Ala	Trp	Asp	Val	Phe				
385		390									395			400					
cag	ctc	aa	ga	ag	tc	gg	gt	gt	ag	ac	ca	cg	gc	gt	ct	ga	1248		
Gln	Leu	Asn	Glu	Ser	Ser	Gly	Val	Val	Ser	Thr	Arg	Ala	Val	Leu	Asp				
405		410									415								
cgg	ga	ga	gc	ga	ta	ca	ct	ct	gt	ga	gg	ac	ga	ca	ga	1296			
Arg	Glu	Glu	Ala	Ala	Glu	Tyr	Gln	Leu	Leu	Val	Glu	Ala	Asn	Asp	Gln				
420		425									430								

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gac aca gga gag aat gcc cgc atc acc tac gtg att cag gac ccc gtg Asp Thr Gly Glu Asn Ala Arg Ile Thr Tyr Val Ile Gln Asp Pro Val 820 825 830	2496
ccg cag ttc cgc att gac ccc gac agt ggc acc atg tac acc atg atg Pro Gln Phe Arg Ile Asp Pro Asp Ser Gly Thr Met Tyr Thr Met Met 835 840 845	2544
gag ctg gac tat gag aac cag gtc gcc tac acg ctg acc atc atg gcc Glu Leu Asp Tyr Glu Asn Gln Val Ala Tyr Thr Leu Thr Ile Met Ala 850 855 860	2592
cag gac aac ggc atc ccg cag aaa tca gac acc acc acc cta gag atc Gln Asp Asn Gly Ile Pro Gln Lys Ser Asp Thr Thr Leu Glu Ile 865 870 875 880	2640
ctc atc ctc gat gcc aat gac aat gca ccc cag ttc ctg tgg gat ttc	2688

Leu Ile Leu Asp Ala Asn Asp Asn Ala Pro Gln Phe Leu Trp Asp Phe  
 885 890 895  
 tac cag ggt tcc atc ttt gag gat gct cca ccc tcg acc agc atc ctc 2736  
 Tyr Gln Gly Ser Ile Phe Glu Asp Ala Pro Pro Ser Thr Ser Ile Leu  
 900 905 910  
 cag gtc tct gcc acg gac cg<sup>g</sup> gac tca ggt ccc aat ggg cgt ctg ctg 2784  
 Gln Val Ser Ala Thr Asp Arg Asp Ser Gly Pro Asn Gly Arg Leu Leu  
 915 920 925  
 tac acc ttc cag ggt ggg gac gac ggc gat ggg gac ttc tac atc gag 2832  
 Tyr Thr Phe Gln Gly Gly Asp Asp Gly Asp Gly Asp Phe Tyr Ile Glu  
 930 935 940  
 ccc acg tcc ggt gtg att cgc acc cag cgc cg<sup>g</sup> ctg gac cg<sup>g</sup> gag aat 2880  
 Pro Thr Ser Gly Val Ile Arg Thr Gln Arg Arg Leu Asp Arg Glu Asn  
 945 950 955 960  
 gtg gcc gtg tac aac ctt tgg gct ctg gct gtg gat cg<sup>g</sup> ggc agt ccc 2928  
 Val Ala Val Tyr Asn Leu Trp Ala Leu Ala Val Asp Arg Gly Ser Pro  
 965 970 975  
 act ccc ctt agc gcc tcg gta gaa atc cag gtg acc atc ttg gac att 2976  
 Thr Pro Leu Ser Ala Ser Val Glu Ile Gln Val Thr Ile Leu Asp Ile  
 980 985 990  
 aat gac aat gcc ccc atg ttt gag aag gac gaa ctg gag ctg ttt gtt 3024  
 Asn Asp Asn Ala Pro Met Phe Glu Lys Asp Glu Leu Glu Leu Phe Val  
 995 1000 1005  
 gag gag aac aac cca gtg ggg tcg gtg gca aag att cgt gct aac 3072  
 Glu Glu Asn Asn Pro Val Gly Ser Val Val Ala Lys Ile Arg Ala Asn  
 1010 1015 1020  
 gac cct gat gaa ggc cct aat gcc cag atc atg tat cag att gtg gaa 3120  
 Asp Pro Asp Glu Gly Pro Asn Ala Gln Ile Met Tyr Gln Ile Val Glu  
 1025 1030 1035 1040  
 ggg gac atg cg<sup>g</sup> cat ttc ttc cag ctg gac ctg ctc aac ggg gac ctg 3168  
 Gly Asp Met Arg His Phe Phe Gln Leu Asp Leu Leu Asn Gly Asp Leu  
 1045 1050 1055  
 cgt gcc atg gtg gag ctg gac ttt gag gtc cg<sup>g</sup> cg<sup>g</sup> gag tat gtg ctg 3216  
 Arg Ala Met Val Glu Leu Asp Phe Glu Val Arg Arg Glu Tyr Val Leu  
 1060 1065 1070  
 gtg gtg cag gcc acg tcg gct ccg ctg gtg agc cga gcc acg gtg cac 3264  
 Val Val Gln Ala Thr Ser Ala Pro Leu Val Ser Arg Ala Thr Val His  
 1075 1080 1085  
 atc ctt ctc gtg gac cag aat gac aac ccg cct gtg ctg ccc gac ttc 3312  
 Ile Leu Leu Val Asp Gln Asn Asp Asn Pro Pro Val Leu Pro Asp Phe  
 1090 1095 1100  
 cag atc ctc ttc aac aac tat gtc acc aac aag tcc aac agt ttc ccc 3360  
 Gln Ile Leu Phe Asn Asn Tyr Val Thr Asn Lys Ser Asn Ser Phe Pro

1105	1110	1115	1120	
acc ggc gtg atc ggc tgc atc ccg gcc cat gac ccc gac gtg tca gac Thr Gly Val Ile Gly Cys Ile Pro Ala His Asp Pro Asp Val Ser Asp				3408
1125	1130	1135		
agc ctc aac tac acc ttc gtg cag ggc aac gag ctg cgc ctg ttg ctg Ser Leu Asn Tyr Thr Phe Val Gln Gly Asn Glu Leu Arg Leu Leu Leu				3456
1140	1145	1150		
ctg gac ccc gcc acg ggc gaa ctg cag ctc agc cgc gac ctg gac aac Leu Asp Pro Ala Thr Gly Glu Leu Gln Leu Ser Arg Asp Leu Asp Asn				3504
1155	1160	1165		
aac cgg ccg ctg gag gcg ctc atg gag gtg tct gtg tct gat ggc atc Asn Arg Pro Leu Glu Ala Leu Met Glu Val Ser Val Asp Gly Ile				3552
1170	1175	1180		
cac agc gtc acg gcc ttc tgc acc ctg cgt gtc acc atc atc acg gac His Ser Val Thr Ala Phe Cys Thr Leu Arg Val Thr Ile Ile Thr Asp				3600
1185	1190	1195	1200	
gac atg ctg acc aac agc atc act gtc cgc ctg gag aac atg tcc cag Asp Met Leu Thr Asn Ser Ile Thr Val Arg Leu Glu Asn Met Ser Gln				3648
1205	1210	1215		
gag aag ttc ctg tcc ccg ctg gcc ctc ttc gtg gag ggg gtg gcc Glu Lys Phe Leu Ser Pro Leu Leu Ala Leu Phe Val Glu Gly Val Ala				3696
1220	1225	1230		
gcc gtg ctg tcc acc acc aag gac gac gtc ttc gtc ttc aac gtc cag Ala Val Leu Ser Thr Thr Lys Asp Asp Val Phe Val Phe Asn Val Gln				3744
1235	1240	1245		
aac gac acc gac gtc agc tcc aac atc ctg aac gtg acc ttc tcg gcg Asn Asp Thr Asp Val Ser Ser Asn Ile Leu Asn Val Thr Phe Ser Ala				3792
1250	1255	1260		
ctg ctg cct ggc gtc cgc ggc cag ttc ttc ccg tcg gag gac ctg Leu Leu Pro Gly Gly Val Arg Gly Gln Phe Phe Pro Ser Glu Asp Leu				3840
1265	1270	1275	1280	
cag gag cag atc tac ctg aat cgg acg ctg ctg acc acc atc tcc acg Gln Glu Gln Ile Tyr Leu Asn Arg Thr Leu Leu Thr Thr Ile Ser Thr				3888
1285	1290	1295		
cag cgc gtg ctg ccc ttc gac gac aac atc tgc ctg cgc gag ccc tgc Gln Arg Val Leu Pro Phe Asp Asp Asn Ile Cys Leu Arg Glu Pro Cys				3936
1300	1305	1310		
gag aac tac atg aag tgc gtg tcc gtt ctg cga ttc gac agc tcc gcg Glu Asn Tyr Met Lys Cys Val Ser Val Leu Arg Phe Asp Ser Ser Ala				3984
1315	1320	1325		
ccc ttc ctc agc tcc acc acc gtc ctc ttc cgg ccc atc cac ccc atc Pro Phe Leu Ser Ser Thr Thr Val Leu Phe Arg Pro Ile His Pro Ile				4032
1330	1335	1340		

aac ggc ctg cgc tgc cgc tgc ccg ccc ggc ttc acc ggc gac tac tgc Asn Gly Leu Arg Cys Arg Cys Pro Pro Gly Phe Thr Gly Asp Tyr Cys 1345 1350 1355 1360	4080
gag acg gag atc gac ctc tgc tac tcc gac ccg tgc ggc gcc aac ggc Glu Thr Glu Ile Asp Leu Cys Tyr Ser Asp Pro Cys Gly Ala Asn Gly 1365 1370 1375	4128
cgc tgc cgc agc cgc gag ggc ggc tac acc tgc gag tgc ttc gag gac Arg Cys Arg Ser Arg Glu Gly Gly Tyr Thr Cys Glu Cys Phe Glu Asp 1380 1385 1390	4176
ttc act gga gag cac tgt gag gtg gat gcc cgc tca ggc cgc tgt gcc Phe Thr Gly Glu His Cys Glu Val Asp Ala Arg Ser Gly Arg Cys Ala 1395 1400 1405	4224
aac ggg gtg tgc aag aac ggg ggc acc tgc gtg aac ctg ctc atc ggc Asn Gly Val Cys Lys Asn Gly Gly Thr Cys Val Asn Leu Leu Ile Gly 1410 1415 1420	4272
ggc ttc cac tgc gtg tgt cct cct ggc gag tat gag agg ccc tac tgt Gly Phe His Cys Val Cys Pro Pro Gly Glu Tyr Glu Arg Pro Tyr Cys 1425 1430 1435 1440	4320
gag gtg acc acc agg agc ttc ccg ccc cag tcc ttc gtc acc ttc cgg Glu Val Thr Thr Arg Ser Phe Pro Pro Gln Ser Phe Val Thr Phe Arg 1445 1450 1455	4368
ggc ctg aga cag cgc ttc cac ttc acc atc tcc ctc acg ttt gcc act Gly Leu Arg Gln Arg Phe His Phe Thr Ile Ser Leu Thr Phe Ala Thr 1460 1465 1470	4416
cag gaa agg aac ggc ttg ctt ctc tac aac ggc cgc ttc aat gag aag Gln Glu Arg Asn Gly Leu Leu Tyr Asn Gly Arg Phe Asn Glu Lys 1475 1480 1485	4464
cac gac ttc atc gcc ctg gag atc gtg gac gag cag gtg cag ctc acc His Asp Phe Ile Ala Leu Glu Ile Val Asp Glu Gln Val Gln Leu Thr 1490 1495 1500	4512
ttc tct gca ggc gag aca aca acg acc gtg gca ccg aag gtt ccc agt Phe Ser Ala Gly Glu Thr Thr Thr Val Ala Pro Lys Val Pro Ser 1505 1510 1515 1520	4560
ggt gtg agt gac ggg cgg tgg cac tct gtg cag gtg cag tac tac aac Gly Val Ser Asp Gly Arg Trp His Ser Val Gln Val Gln Tyr Tyr Asn 1525 1530 1535	4608
aag ccc aat att ggc cac ctg ggc ctg ccc cat ggg ccg tcc ggg gaa Lys Pro Asn Ile Gly His Leu Gly Leu Pro His Gly Pro Ser Gly Glu 1540 1545 1550	4656
aag atg gcc gtg gtg aca gtg gat gat tgt gac aca acc atg gct gtg Lys Met Ala Val Val Thr Val Asp Asp Cys Asp Thr Thr Met Ala Val 1555 1560 1565	4704

cgc ttt gga aag gac atc ggg aac tac agc tgc gct gcc cag ggc act 4752  
 Arg Phe Gly Lys Asp Ile Gly Asn Tyr Ser Cys Ala Ala Gln Gly Thr  
 1570 1575 1580

cag acc ggc tcc aag aag tcc ctg gat ctg acc ggc cct cta ctc ctg 4800  
 Gln Thr Gly Ser Lys Lys Ser Leu Asp Leu Thr Gly Pro Leu Leu Leu  
 1585 1590 1595 1600

ggg ggt gtc ccc aac ctg cca gaa gac ttc cca gtg cac aac cgg cag 4848  
 Gly Gly Val Pro Asn Leu Pro Glu Asp Phe Pro Val His Asn Arg Gln  
 1605 1610 1615

ttc gtg ggc tgc atg cgg aac ctg tca gtc gac ggc aaa aat gtg gac 4896  
 Phe Val Gly Cys Met Arg Asn Leu Ser Val Asp Gly Lys Asn Val Asp  
 1620 1625 1630

atg gcc gga ttc atc gcc aac aat ggc acc cgg gaa ggc tgc gct gct 4944  
 Met Ala Gly Phe Ile Ala Asn Asn Gly Thr Arg Glu Gly Cys Ala Ala  
 1635 1640 1645

cg agg aac ttc tgc gat ggg agg cgg tgt cag aat gga ggc acc tgt 4992  
 Arg Arg Asn Phe Cys Asp Gly Arg Arg Cys Gln Asn Gly Gly Thr Cys  
 1650 1655 1660

gtc aac agg tgg aat atg tat ctg tgt gag tgt cca ctc cga ttc ggc 5040  
 Val Asn Arg Trp Asn Met Tyr Leu Cys Glu Cys Pro Leu Arg Phe Gly  
 1665 1670 1675 1680

ggg aag aac tgt gag caa gcc atg cct cac ccc cag ctc ttc agc ggt 5088  
 Gly Lys Asn Cys Glu Gln Ala Met Pro His Pro Gln Leu Phe Ser Gly  
 1685 1690 1695

gag agc gtc gtg tcc tgg agt gac ctg aac atc atc tct gtg ccc 5136  
 Glu Ser Val Val Ser Trp Ser Asp Leu Asn Ile Ile Ile Ser Val Pro  
 1700 1705 1710

tgg tac ctg ggg ctc atg ttc cgg acc cgg aag gag gac agc gtt ctg 5184  
 Trp Tyr Leu Gly Leu Met Phe Arg Thr Arg Lys Glu Asp Ser Val Leu  
 1715 1720 1725

atg gag gcc acc agt ggt ggg ccc acc agc ttt cgc ctc cag atc ctg 5232  
 Met Glu Ala Thr Ser Gly Gly Pro Thr Ser Phe Arg Leu Gln Ile Leu  
 1730 1735 1740

aac aac tac ctc cag ttt gag gtg tcc cac ggc ccc tcc gat gtg gag 5280  
 Asn Asn Tyr Leu Gln Phe Glu Val Ser His Gly Pro Ser Asp Val Glu  
 1745 1750 1755 1760

tcc gtg atg ctg tcc ggg ttg cgg gtg acc gac ggg gag tgg cac cac 5328  
 Ser Val Met Leu Ser Gly Leu Arg Val Thr Asp Gly Glu Trp His His  
 1765 1770 1775

ctg ctg atc gag ctg aag aat gtt aag gag gac agt gag atg aag cac 5376  
 Leu Leu Ile Glu Leu Lys Asn Val Lys Glu Asp Ser Glu Met Lys His  
 1780 1785 1790

ctg gtc acc atg acc ttg gac tat ggg atg gac cag aac aag gca gat 5424

Leu Val Thr Met Thr Leu Asp Tyr Gly Met Asp Gln Asn Lys Ala Asp			
1795	1800	1805	
atc ggg ggc atg ctt ccc ggg ctg acg gta agg agc gtc gtg gtc gga			5472
Ile Gly Gly Met Leu Pro Gly Leu Thr Val Arg Ser Val Val Val Gly			
1810	1815	1820	
ggc gcc tct gaa gac aag gtc tcc gtg cgc cgt gga ttc cga ggc tgc			5520
Gly Ala Ser Glu Asp Lys Val Ser Val Arg Arg Gly Phe Arg Gly Cys			
1825	1830	1835	1840
atg cag gga gtg agg atg ggg ggg acg ccc acc aac gtc gcc acc ctg			5568
Met Gln Gly Val Arg Met Gly Gly Thr Pro Thr Asn Val Ala Thr Leu			
1845	1850	1855	
aac atg aac aac gca ctc aag gtc agg gtg aag gac ggc tgt gat gtg			5616
Asn Met Asn Asn Ala Leu Lys Val Arg Val Lys Asp Gly Cys Asp Val			
1860	1865	1870	
gac gac ccc tgt acc tcg agc ccc tgt ccc ccc aat agc cgc tgc cac			5664
Asp Asp Pro Cys Thr Ser Ser Pro Cys Pro Pro Asn Ser Arg Cys His			
1875	1880	1885	
gac gcc tgg gag gac tac agc tgc gtc tgt gac aaa ggg tac ctt gga			5712
Asp Ala Trp Glu Asp Tyr Ser Cys Val Cys Asp Lys Gly Tyr Leu Gly			
1890	1895	1900	
ata aac tgt gtg gat gcc tgt cac ctg aac ccc tgc gag aac atg ggg			5760
Ile Asn Cys Val Asp Ala Cys His Leu Asn Pro Cys Glu Asn Met Gly			
1905	1910	1915	1920
gcc tgc gtg cgc tcc ccc ggc tcc ccg cag ggc tac gtg tgc gag tgt			5808
Ala Cys Val Arg Ser Pro Gly Ser Pro Gln Gly Tyr Val Cys Glu Cys			
1925	1930	1935	
ggg ccc agt cac tac ggg ccg tac tgt gag aac aaa ctc gac ctt ccg			5856
Gly Pro Ser His Tyr Gly Pro Tyr Cys Glu Asn Lys Leu Asp Leu Pro			
1940	1945	1950	
tgc ccc aga ggc tgg tgg ggg aac ccc gtc tgt gga ccc tgc cac tgt			5904
Cys Pro Arg Gly Trp Trp Gly Asn Pro Val Cys Gly Pro Cys His Cys			
1955	1960	1965	
gcc gtc agc aaa ggc ttt gat ccc gac tgt aat aag acc aac ggc cag			5952
Ala Val Ser Lys Gly Phe Asp Pro Asp Cys Asn Lys Thr Asn Gly Gln			
1970	1975	1980	
tgc caa tgc aag gag aat tac tac aag ctc cta gcc cag gac acc tgt			6000
Cys Gln Cys Lys Glu Asn Tyr Tyr Lys Leu Leu Ala Gln Asp Thr Cys			
1985	1990	1995	2000
ctg ccc tgc gac tgc ttc ccc cat ggc tcc cac agc cgc act tgc gac			6048
Leu Pro Cys Asp Cys Phe Pro His Gly Ser His Arg Thr Cys Asp			
2005	2010	2015	
atg gcc acc ggg cag tgt gcc tgc aag ccc ggc gtc atc ggc cgc cag			6096
Met Ala Thr Gly Gln Cys Ala Cys Lys Pro Gly Val Ile Gly Arg Gln			

2020	2025	2030	
tgc aac cgc tgc gac aac ccg ttt gcc gag gtc acc acg ctc ggc tgt Cys Asn Arg Cys Asp Asn Pro Phe Ala Glu Val Thr Thr Leu Gly Cys 2035	2040	2045	6144
gaa gtg atc tac aat ggc tgt ccc aaa gca ttt gag gcc ggc atc tgg Glu Val Ile Tyr Asn Gly Cys Pro Lys Ala Phe Glu Ala Gly Ile Trp 2050	2055	2060	6192
tgg cca cag acc aag ttc ggg cag ccg gct gcg gtg cca tgc cct aag Trp Pro Gln Thr Lys Phe Gly Gln Pro Ala Ala Val Pro Cys Pro Lys 2065	2070	2075	6240
gga tcc gtt gga aat gcg gtc cga cac tgc agc ggg gag aag ggc tgg Gly Ser Val Gly Asn Ala Val Arg His Cys Ser Gly Glu Lys Gly Trp 2085	2090	2095	6288
ctg ccc cca gag ctc ttt aac tgt acc acc atc tcc ttc gtg gac ctc Leu Pro Pro Glu Leu Phe Asn Cys Thr Thr Ile Ser Phe Val Asp Leu 2100	2105	2110	6336
agg gcc atg aat gag aag ctg agc cgc aat gag acg cag gtg gac ggc Arg Ala Met Asn Glu Lys Leu Ser Arg Asn Glu Thr Gln Val Asp Gly 2115	2120	2125	6384
gcc agg gcc ctg cag ctg gtg agg gcg ctg cgc agt gct aca cag cac Ala Arg Ala Leu Gln Leu Val Arg Ala Leu Arg Ser Ala Thr Gln His 2130	2135	2140	6432
acg ggc acg ctc ttt ggc aat gac gtg cgc acg gcc tac cag ctg ctg Thr Gly Thr Leu Phe Gly Asn Asp Val Arg Thr Ala Tyr Gln Leu Leu 2145	2150	2155	6480
ggc cac gtc ctt cag cac gag agc tgg cag cag ggc ttc gac ctg gca Gly His Val Leu Gln His Glu Ser Trp Gln Gln Gly Phe Asp Leu Ala 2165	2170	2175	6528
gcc acg cag gac gcc gac ttt cac gag gac gtc atc cac tcg ggc agc Ala Thr Gln Asp Ala Asp Phe His Glu Asp Val Ile His Ser Gly Ser 2180	2185	2190	6576
gcc ctc ctg gcc cca acc agg gcg ggc tgg gag cag atc cag cgg Ala Leu Ala Pro Ala Thr Arg Ala Ala Trp Glu Gln Ile Gln Arg 2195	2200	2205	6624
acg gag ggc acg gca cag ctg ctc cgg cgc ctc gag ggc tac ttc Ser Glu Gly Gly Thr Ala Gln Leu Leu Arg Arg Leu Glu Gly Tyr Phe 2210	2215	2220	6672
agc aac gtg gca cgc aac gtg cgg cgg acg tac ctg cgg ccc ttc gtc Ser Asn Val Ala Arg Asn Val Arg Arg Thr Tyr Leu Arg Pro Phe Val 2225	2230	2235	6720
atc gtc acc gcc aac atg att ctt gct gtc gac atc ttt gac aag ttc Ile Val Thr Ala Asn Met Ile Leu Ala Val Asp Ile Phe Asp Lys Phe 2245	2250	2255	6768

aac ttt acg gga gcc agg gtc ccg cga ttc gac acc atc cat gaa gag 6816  
 Asn Phe Thr Gly Ala Arg Val Pro Arg Phe Asp Thr Ile His Glu Glu  
 2260 2265 2270

ttc ccc agg gag ctg gag tcc tcc gtc tcc cca gcc gac ttc ttc 6864  
 Phe Pro Arg Glu Leu Glu Ser Ser Val Ser Phe Pro Ala Asp Phe Phe  
 2275 2280 2285

aga cca cct gaa gaa aaa gaa ggc ccc ctg ctg agg ccg gct ggc cg 6912  
 Arg Pro Pro Glu Glu Lys Glu Gly Pro Leu Leu Arg Pro Ala Gly Arg  
 2290 2295 2300

agg acc acc ccg cag acc acg cgc ccg ggg cct ggc acc gag agg gag 6960  
 Arg Thr Thr Pro Gln Thr Thr Arg Pro Gly Pro Gly Thr Glu Arg Glu  
 2305 2310 2315 2320

gcc ccg atc agc agg cgg agg cga cac cct gat gac gct ggc cag ttc 7008  
 Ala Pro Ile Ser Arg Arg Arg His Pro Asp Asp Ala Gly Gln Phe  
 2325 2330 2335

gcc gtc gct ctg gtc atc att tac cgc acc ctg ggg cag ctc ctg ccc 7056  
 Ala Val Ala Leu Val Ile Ile Tyr Arg Thr Leu Gly Gln Leu Leu Pro  
 2340 2345 2350

gag cgc tac gac ccc gac cgt cgc agc ctc cgg ttg cct cac cgg ccc 7104  
 Glu Arg Tyr Asp Pro Asp Arg Arg Ser Leu Arg Leu Pro His Arg Pro  
 2355 2360 2365

atc att aat acc ccg atg gtg agc acg ctg gtg tac agc gag ggg gct 7152  
 Ile Ile Asn Thr Pro Met Val Ser Thr Leu Val Tyr Ser Glu Gly Ala  
 2370 2375 2380

ccg ctc ccg aga ccc ctg gag agg ccc gtc ctg gtg gag ttc gcc ctg 7200  
 Pro Leu Pro Arg Pro Leu Glu Arg Pro Val Leu Val Glu Phe Ala Leu  
 2385 2390 2395 2400

ctg gag gtg gag gag cga acc aag cct gtc tgc gtg ttc tgg aac cac 7248  
 Leu Glu Val Glu Glu Arg Thr Lys Pro Val Cys Val Phe Trp Asn His  
 2405 2410 2415

tcc ctg gcc gtt ggt ggg acg gga ggg tgg tct gcc cgg ggc tgc gag 7296  
 Ser Leu Ala Val Gly Gly Thr Gly Gly Trp Ser Ala Arg Gly Cys Glu  
 2420 2425 2430

ctc ctg tcc agg aac cgg aca cat gtc gcc tgc cag tgc agc cac aca 7344  
 Leu Leu Ser Arg Asn Arg Thr His Val Ala Cys Gln Cys Ser His Thr  
 2435 2440 2445

gcc agc ttt gcg gtg ctc atg gat atc tcc agg cgt gag aac ggg gag 7392  
 Ala Ser Phe Ala Val Leu Met Asp Ile Ser Arg Arg Glu Asn Gly Glu  
 2450 2455 2460

gtc ctg cct ctg aag att gtc acc tat gcc gct gtg tcc ttg tca ctg 7440  
 Val Leu Pro Leu Lys Ile Val Thr Tyr Ala Ala Val Ser Leu Ser Leu  
 2465 2470 2475 2480

gca gcc ctg ctg gtg gcc ttc gtc ctc ctg agc ctg gtc cgc atg ctg Ala Ala Leu Leu Val Ala Phe Val Leu Leu Ser Leu Val Arg Met Leu 2485 2490 2495	7488
cgc tcc aac ctg cac agc att cac aag cac ctc gcc gtg gcg ctc ttc Arg Ser Asn Leu His Ser Ile His Lys His Leu Ala Val Ala Leu Phe 2500 2505 2510	7536
ctc tct cag ctg gtg ttc gtg att ggg atc aac cag acg gaa aac ccg Leu Ser Gln Leu Val Phe Val Ile Gly Ile Asn Gln Thr Glu Asn Pro 2515 2520 2525	7584
ttt ctg tgc aca gtg gtt gcc atc ctc ctc cac tac atc tac atg agc Phe Leu Cys Thr Val Val Ala Ile Leu Leu His Tyr Ile Tyr Met Ser 2530 2535 2540	7632
acc ttt gcc tgg acc ctc gtg gag agc ctg cat gtc tac cgc atg ctg Thr Phe Ala Trp Thr Leu Val Glu Ser Leu His Val Tyr Arg Met Leu 2545 2550 2555 2560	7680
acc gag gtg cgc aac atc gac acg ggg ccc atg cgg ttc tac tac gtc Thr Glu Val Arg Asn Ile Asp Thr Gly Pro Met Arg Phe Tyr Tyr Val 2565 2570 2575	7728
gtg ggc tgg ggc atc ccg gcc att gtc aca gga ctg gcg gtc ggc ctg Val Gly Trp Gly Ile Pro Ala Ile Val Thr Gly Leu Ala Val Gly Leu 2580 2585 2590	7776
gac ccc cag ggc tac ggg aac ccc gac ttc tgc tgg ctg tcg ctt caa Asp Pro Gln Gly Tyr Gly Asn Pro Asp Phe Cys Trp Leu Ser Leu Gln 2595 2600 2605	7824
gac acc ctg att tgg agc ttt gcg ggg ccc atc gga gct gtt ata atc Asp Thr Leu Ile Trp Ser Phe Ala Gly Pro Ile Gly Ala Val Ile Ile 2610 2615 2620	7872
atc aac aca gtc act tct gtc cta tct gca aag gtt tcc tgc caa aga Ile Asn Thr Val Thr Ser Val Leu Ser Ala Lys Val Ser Cys Gln Arg 2625 2630 2635 2640	7920
aag cac cat tat tat ggg aaa aaa ggg atc gtc tcc ctg ctg agg acc Lys His His Tyr Tyr Gly Lys Lys Gly Ile Val Ser Leu Leu Arg Thr 2645 2650 2655	7968
gca ttc ctc ctg ctg ctc atc agc gcc acc tgg ctg ctg ggg ctg Ala Phe Leu Leu Leu Leu Ile Ser Ala Thr Trp Leu Leu Gly Leu 2660 2665 2670	8016
ctg gct gtg aac cgc gat gca ctg agc ttt cac tac ctc ttc gcc atc Leu Ala Val Asn Arg Asp Ala Leu Ser Phe His Tyr Leu Phe Ala Ile 2675 2680 2685	8064
ttc agc ggc tta cag ggc ccc ttc gtc ctc ctt ttc cac tgc gtg ctc Phe Ser Gly Leu Gln Gly Pro Phe Val Leu Leu Phe His Cys Val Leu 2690 2695 2700	8112
aac cag gag gtc cgg aag cac ctg aag ggc gtg ctc ggc ggg agg aag	8160

Asn Gln Glu Val Arg Lys His Leu Lys Gly Val Leu Gly Gly Arg Lys			
2705	2710	2715	2720
ctg cac ctg gag gac tcc gcc acc acc agg gcc acc ctg ctg acg cgc			8208
Leu His Leu Glu Asp Ser Ala Thr Thr Arg Ala Thr Leu Leu Thr Arg			
2725	2730	2735	
tcc ctc aac tgc aac acc acc ttc ggt gac ggg cct gac atg ctg cgc			8256
Ser Leu Asn Cys Asn Thr Thr Phe Gly Asp Gly Pro Asp Met Leu Arg			
2740	2745	2750	
aca gac ttg ggc gag tcc acc gcc tcg ctg gac agc atc gtc agg gat			8304
Thr Asp Leu Gly Glu Ser Thr Ala Ser Leu Asp Ser Ile Val Arg Asp			
2755	2760	2765	
gaa ggg atc cag aag ctc ggc gtg tcc tct ggg ctg gtg agg ggc agc			8352
Glu Gly Ile Gln Lys Leu Gly Val Ser Ser Gly Leu Val Arg Gly Ser			
2770	2775	2780	
cac gga gag cca gac gcg tcc ctc atg ccc agg agc tgc aag gat ccc			8400
His Gly Glu Pro Asp Ala Ser Leu Met Pro Arg Ser Cys Lys Asp Pro			
2785	2790	2795	2800
cct ggc cac gat tcc gac tca gat agc gag ctg tcc ctg gat gag cag			8448
Pro Gly His Asp Ser Asp Ser Asp Ser Glu Leu Ser Leu Asp Glu Gln			
2805	2810	2815	
agc agc tct tac gcc tcc tca cac tcg tca gac agc gag gac gat ggg			8496
Ser Ser Ser Tyr Ala Ser Ser His Ser Ser Asp Ser Glu Asp Asp Gly			
2820	2825	2830	
gtg gga gct gag gaa aaa tgg gac ccg gcc agg ggc gcc gtc cac agc			8544
Val Gly Ala Glu Glu Lys Trp Asp Pro Ala Arg Gly Ala Val His Ser			
2835	2840	2845	
acc ccc aaa ggg gac gct gtg gcc aac cac gtt ccg gcc ggc tgg ccc			8592
Thr Pro Lys Gly Asp Ala Val Ala Asn His Val Pro Ala Gly Trp Pro			
2850	2855	2860	
gac cag agc ctg gct gag agt gac agt gag gac ccc agc ggc aag ccc			8640
Asp Gln Ser Leu Ala Glu Ser Asp Ser Glu Asp Pro Ser Gly Lys Pro			
2865	2870	2875	2880
cgc ctg aag gtg gag acc aag gtc agc gtg gag ctg cac cgc gag gag			8688
Arg Leu Lys Val Glu Thr Lys Val Ser Val Glu Leu His Arg Glu Glu			
2885	2890	2895	
cag ggc agt cac cgt gga gag tac ccc ccg gac cag gag agc ggg ggc			8736
Gln Gly Ser His Arg Gly Glu Tyr Pro Pro Asp Gln Glu Ser Gly Gly			
2900	2905	2910	
gca gcc agg ctt gct agc agc cag ccc cca gag cag agg aaa ggc atc			8784
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Cys Tyr Leu Asn Ser Leu Leu Gln Thr Leu His Phe Thr Pro Glu Phe			
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Arg Gln His Asp Val Gln Glu Leu Asn Arg Ile Leu Phe Ser Ala Leu			
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Tyr His Gly Thr Ile Val Asn Gln Ile Val Cys Lys Glu Cys Lys Asn			
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Val Ser Glu Arg Gln Glu Asp Phe Leu Asp Leu Thr Val Ala Val Lys			
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Arg Gln His Asp Val Gln Glu Leu Asn Arg Ile Leu Phe Ser Ala Leu  
130 135 140 145

gaa act tct tta gtt ggg acc tcc ggt cat gac ctc atc tat cgt ctg 595  
Glu Thr Ser Leu Val Gly Thr Ser Gly His Asp Leu Ile Tyr Arg Leu  
150 155 160

tac cat gga acc att gtt aac cag att gtt tgt aaa gaa tgt aag aac 643  
Tyr His Gly Thr Ile Val Asn Gln Ile Val Cys Lys Glu Cys Lys Asn

165

170

175

gtt agc gag agg cag gaa gac ttc tta gat cta aca gta gca gtc aaa			691
Val Ser Glu Arg Gln Glu Asp Phe Leu Asp Leu Thr Val Ala Val Lys			
180	185	190	
aat gta tcc ggt ttg gaa gat gct ctc tgg aac atg tat gta gaa gag			739
Asn Val Ser Gly Leu Glu Asp Ala Leu Trp Asn Met Tyr Val Glu Glu			
195	200	205	
gaa gtt ttt gat tgt gac aac ttg tac cac tgt gga act tgt gac agg			787
Glu Val Phe Asp Cys Asp Asn Leu Tyr His Cys Gly Thr Cys Asp Arg			
210	215	220	225
ctg gtt aaa gca gca aag tcg gcc aaa tta cgt aag ctg cct cct ttt			835
Leu Val Lys Ala Ala Lys Ser Ala Lys Leu Arg Lys Leu Pro Pro Phe			
230	235	240	
ctt act gtt tca tta cta aga ttt aat ttt gat ttt gtg aaa tgc gaa			883
Leu Thr Val Ser Leu Leu Arg Phe Asn Phe Asp Phe Val Lys Cys Glu			
245	250	255	
cgc tac aag gaa act agc tgt tat aca ttc cct ctc cgg att aat ctc			931
Arg Tyr Lys Glu Thr Ser Cys Tyr Thr Phe Pro Leu Arg Ile Asn Leu			
260	265	270	
aag ccc ttt tgt gaa cag agt gaa ttg gat gac tta gaa tat ata tat			979
Lys Pro Phe Cys Glu Gln Ser Glu Leu Asp Asp Leu Glu Tyr Ile Tyr			
275	280	285	
gac ctc ttc tca gtt att ata cac aaa ggt ggc tgc tac gga ggc cat			1027
Asp Leu Phe Ser Val Ile Ile His Lys Gly Gly Cys Tyr Gly Gly His			
290	295	300	305
tac cat gta tat att aaa gat gtt gat cat ttg gga aac tgg cag ttt			1075
Tyr His Val Tyr Ile Lys Asp Val Asp His Leu Gly Asn Trp Gln Phe			
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caa gag gaa aaa agt aaa cca gat gtg aat ctg aaa gat ctc cag agt			1123
Gln Glu Glu Lys Ser Lys Pro Asp Val Asn Leu Lys Asp Leu Gln Ser			
325	330	335	
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Glu Glu Glu Ile Asp His Pro Leu Met Ile Leu Lys Ala Ile Leu Leu			
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Glu Glu Asn Asn Leu Ile Pro Val Asp Gln Leu Gly Gln Lys Leu Leu			
355	360	365	
aaa aag ata gga ata tct tgg aac aag aag tac aga aaa cag cat gga			1267
Lys Lys Ile Gly Ile Ser Trp Asn Lys Lys Tyr Arg Lys Gln His Gly			
370	375	380	385
cca ttg cgg aag ttc tta cag ctc cat tct cag ata ttt cta ctc agt			1315
Pro Leu Arg Lys Phe Leu Gln Leu His Ser Gln Ile Phe Leu Leu Ser			
390	395	400	

tca gat gaa agt aca gtt cgt ctc ttg aag aat agt tct ctc cag gct Ser Asp Glu Ser Thr Val Arg Leu Leu Lys Asn Ser Ser Leu Gln Ala 405	410	415	1363	
gag tct gat ttc caa agg aat gac cag caa att ttc aag atg ctt cct Glu Ser Asp Phe Gln Arg Asn Asp Gln Gln Ile Phe Lys Met Leu Pro 420	425	430	1411	
cca gaa tcc cca ggt tta aac aat agc atc tcc tgt ccc cac tgg ttt Pro Glu Ser Pro Gly Leu Asn Asn Ser Ile Ser Cys Pro His Trp Phe 435	440	445	1459	
gat ata aat gat tct aaa gtc cag cca atc agg gaa aag gat att gaa Asp Ile Asn Asp Ser Lys Val Gln Pro Ile Arg Glu Lys Asp Ile Glu 450	455	460	465	1507
cag caa ttt cag ggt aaa gaa agt gcc tac atg ttg ttt tat cgg aaa Gln Gln Phe Gln Gly Lys Glu Ser Ala Tyr Met Leu Phe Tyr Arg Lys 470	475	480	1555	
tcc cag ttg cag aga ccc cct gaa gct cga gct aat cca aga tat ggg Ser Gln Leu Gln Arg Pro Pro Glu Ala Arg Ala Asn Pro Arg Tyr Gly 485	490	495	1603	
gtt cca tgt cat tta ctg aat gaa atg gat gca gct aac att gaa ctg Val Pro Cys His Leu Leu Asn Glu Met Asp Ala Ala Asn Ile Glu Leu 500	505	510	1651	
caa acc aaa agg gca gaa tgt gat tct gca aac aat act ttt gaa ttg Gln Thr Lys Arg Ala Glu Cys Asp Ser Ala Asn Asn Thr Phe Glu Leu 515	520	525	1699	
cat ctt cac ctg ggc cct cag tat cat ttc ttc aat ggg gct ctg cac His Leu His Leu Gly Pro Gln Tyr His Phe Phe Asn Gly Ala Leu His 530	535	540	545	1747
cca gta gtc tct caa aca gaa agc gtg tgg gat ttg acc ttt gat aaa Pro Val Val Ser Gln Thr Glu Ser Val Trp Asp Leu Thr Phe Asp Lys 550	555	560	1795	
aga aaa act tta gga gat ctc cgg cag tca ata ttt cag ctg tta gaa Arg Lys Thr Leu Gly Asp Leu Arg Gln Ser Ile Phe Gln Leu Leu Glu 565	570	575	1843	
ttt tgg gaa gga gac atg gtt ctt agt gtt gca aag ctt gta cca gca Phe Trp Glu Gly Asp Met Val Leu Ser Val Ala Lys Leu Val Pro Ala 580	585	590	1891	
gga ctt cac att tac cag tca ctt ggc ggg gat gaa ctg aca ctg tgt Gly Leu His Ile Tyr Gln Ser Leu Gly Gly Asp Glu Leu Thr Leu Cys 595	600	605	1939	
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 630 635 640  
  
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 Leu Leu Asn Val Leu His Leu Asp Thr Ser Ser Asp Gly Glu Lys Cys  
 645 650 655  
  
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 Leu Lys Glu Ala Glu Leu Lys Met Gly Ser Ser Leu Gly Leu Cys Leu  
 820 825 830  
  
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 Gly Lys Ala Pro Ser Ser Gln Leu Phe Leu Phe Phe Ala Met Gly  
 835 840 845  
  
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Ser Asp Val Gln Pro Gly Thr Glu Met Glu Ile Val Val Glu Glu Thr  
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 Cys Ser Gly Asp Thr Leu Leu Ile Glu Gly Gln Leu Pro Pro Leu  
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1090 1095 1100 1105			
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1110 1115 1120			
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1125 1130 1135			
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1140 1145 1150			
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1155 1160 1165			
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1205 1210 1215			
aaa agt atc ttg gct gcc cgt gtg cca ggg act gca tgc cct ctg cca Lys Ser Ile Leu Ala Ala Arg Val Pro Gly Thr Ala Cys Pro Leu Pro			3811
1220 1225 1230			
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1235 1240 1245			
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1285 1290 1295			
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1300 1305 1310			

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Glu Ser Ser Ile Pro Lys Thr Val Ser His Val Leu Ser Leu Leu Val	
1315 1320 1325	
acc tgg gcc tca cggtt ctc gtc agc ccc gtc act gat ggg aag cag	4147
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cac tga	4153
His *	

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gtgccaggtg tgtccagagg agccca atg ggc agt gag gca gcc atg ggg ctg	173
Met Gly Ser Glu Ala Ala Met Gly Leu	
1 5	
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Asp Ala Leu Val Pro Leu Ala Val Thr Val Ala Ile Phe Leu Leu Leu	
10 15 20 25	
gtg gac ctg atg cag cag cac caa cgc tgg act gca cgc tac ccg cca	269
Val Asp Leu Met Gln Gln His Gln Arg Trp Thr Ala Arg Tyr Pro Pro	
30 35 40	
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Gly Pro Leu Pro Gly Leu Gly Asn Leu Leu His Val Asp Phe	
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Gln Asn Ile Tyr Thr Phe Asn Gln Val Arg Glu Glu Val Leu Arg Ile	
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Pro His His Gln Gln Thr Trp Val Val Gly Gly Ala Thr Val Trp Thr	
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Arg Ser Gln Ala Glu Lys Gly Lys Gln Ile *	

90	95	100				
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gcctggaggt	ggaactgtac	ttggcagtgg	gcgtgcacgc	ccattggcca	tc`tatgtta	584
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gccagggggcc	ctggtagcc	cttttatatc	ccacaattat	accctgggc	tctcttgtcc	704
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 His Glu Ala Glu Glu Gly His Gly Ile Thr His Ser Cys Ala Val Cys  
 10 15 20

att ctc tgt ggg cct agc agg gaa ggg gac agc cct gtg gca atg ggc 151  
 Ile Leu Cys Gly Pro Ser Arg Glu Gly Asp Ser Pro Val Ala Met Gly  
                  25                 30                 35

atg aca cgg atg ctc ctg gaa tgc agt ctc agt gac aag ttg tgt gtc 199  
 Met Thr Arg Met Leu Leu Glu Cys Ser Leu Ser Asp Lys Leu Cys Val  
         40                  45                  50

atc cag gag aag cag tat gaa gtg att atc gtc cca act ttg ttg gtt 247  
 Ile Gln Glu Lys Gln Tyr Glu Val Ile Ile Val Pro Thr Leu Leu Val  
 55 60 65 70

act atc ttc ctc atc ctt ctt ggg gtc atc ctg tgg ctt ttt atc aga 295  
 Thr Ile Phe Leu Ile Leu Leu Gly Val Ile Leu Trp Leu Phe Ile Arg  
                  75                 80                 85

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 Glu Gln Arg Thr Gln Gln Gln Arg Ser Gly Pro Gln Gly Ile Ala Pro  
 90 95 100

gtt cct cca cct agg gac cta agc tgg gaa gca gga cat gga gga aat 391  
Val Pro Pro Pro Arg Asp Leu Ser Trp Glu Ala Gly His Gly Gly Asn

105

110

115

gtg gct ttg cca ctt aag gag aca tcc gtg gaa aac ttt ctg gga gct	439
Val Ala Leu Pro Leu Lys Glu Thr Ser Val Glu Asn Phe Leu Gly Ala	
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Thr Thr Pro Ala Leu Ala Lys Leu Gln Val Pro Arg Glu Gln Leu Ser	
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Glu Val Leu Glu Gln Ile Cys Ser Gly Ser Cys Gly Pro Ile Phe Arg	
155 160 165	
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Ala Asn Met Asn Thr Gly Asp Pro Ser Lys Pro Lys Ser Val Ile Leu	
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Lys Ala Leu Lys Glu Pro Ala Gly Leu His Glu Val Gln Asp Phe Leu	
185 190 195	
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Gly Arg Ile Lys Phe His Gln Tyr Leu Gly Lys His Lys Asn Leu Val	
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Gln Leu Glu Gly Cys Cys Thr Glu Lys Leu Pro Leu Tyr Met Val Leu	
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Glu Asp Val Ala Gln Gly Asp Leu Leu Gly Phe Leu Trp Thr Cys Arg	
235 240 245	
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Arg Asp Val Met Thr Met Asp Gly Leu Leu Tyr Asp Leu Thr Glu Lys	
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Gln Val Tyr His Ile Gly Lys Gln Val Leu Leu Ala Leu Glu Phe Leu	
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Gln Glu Lys His Leu Phe His Gly Asp Val Ala Ala Arg Asn Ile Leu	
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atg caa agt gat ctc act gct aag ctc tgt gga tta ggc ctg gct tat	967
Met Gln Ser Asp Leu Thr Ala Lys Leu Cys Gly Leu Gly Leu Ala Tyr	
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Glu Val Tyr Thr Arg Gly Ala Ile Ser Ser Thr Gln Thr Ile Pro Leu	
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Lys Trp Leu Ala Pro Glu Arg Leu Leu Leu Arg Pro Ala Ser Ile Arg	
330 335 340	

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1 5 10

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gga ggg tgc att atc ttt ctg cac tgg agg aag aac ttg agg cg <sup>g</sup> gaa Gly Gly Cys Ile Ile Phe Leu His Trp Arg Lys Asn Leu Arg Arg Glu 30 35 40 45	204
gag cat gcc cag cag tgg gtg gag gtg atg aga gct gcc aca ttc acc Glu His Ala Gln Gln Trp Val Glu Val Met Arg Ala Ala Thr Phe Thr 50 55 60	252
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aat gca gcc atc aac acg ggc cct gcc cct gct gtc acc aag act gag Asn Ala Ala Ile Asn Thr Gly Pro Ala Pro Ala Val Thr Lys Thr Glu 80 85 90	348
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gct ccc ctg caa cct gca ctg cag ctg gct cca cag cag ccc cag gcc Ala Pro Leu Gln Pro Ala Leu Gln Leu Ala Pro Gln Gln Pro Gln Ala 130 135 140	492
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Ile Leu Leu Pro Gln Pro Ala Ser Val Arg His Tyr Ala Trp Val Val  
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 Tyr Cys Pro Asp Cys Asp Thr Arg Tyr Asn Ile Lys Asn Arg Glu Val  
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275 280

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1812

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